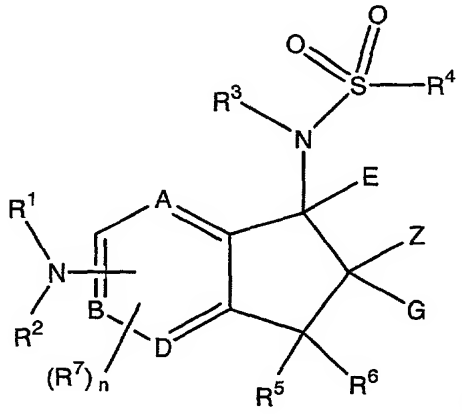
CLAIMS

We claim:

1. A compound having potassium channel inhibitory activity of formula (I), or a pharmaceutically acceptable salt or prodrug thereof:



(I)

wherein,

A, B, and D are selected from a substituted carbon atom, a nitrogen atom, or N→O, wherein at least one of A, B, and D is a substituted carbon atom and at most only one of A, B and D is N→O;

E is hydrogen, or alkyl; G is hydrogen, or alkyl; or E and G taken together form a bond (site of unsaturation);

R^1 is selected from hydrogen, alkyl, carbocycloalkyl, aryl, (aryl)alkyl, heterocyclo, (heterocyclo)alkyl, heteroaryl, and (heteroaryl)alkyl;

R^2 is selected from alkyl, carbocycloalkyl, aryl, (aryl)alkyl, heterocyclo, (heterocyclo)alkyl, heteroaryl, and (heteroaryl)alkyl;

R^3 is selected from hydrogen (H), alkyl, carbocycloalkyl, aryl, (aryl)alkyl, heterocyclo, (heterocyclo)alkyl, heteroaryl, (heteroaryl)alkyl, aminoalkyl; substituted aminoalkyl, carboxyalkyl, alkoxyalkanoyl, aminoalkanoyl, substituted aminoalkanoyl, alkanoylamidoalkyl, alkanoyl(substituted amido)alkyl, aroylamidoalkyl, aroyl(substituted amido)alkyl, heterocyclocarbonylamidoalkyl,

heterocyclocarbonyl(substituted amido)alkyl, heteroaroylamidoalkyl, and heteroaroyl(substituted amido)alkyl;

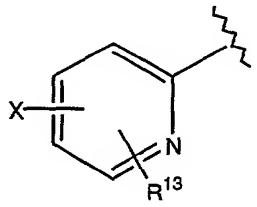
R^4 is selected from alkyl, carbocycloalkyl, aryl, (aryl)alkyl, heteroaryl and heterocyclo;

R^5 and R^6 are each independently selected from hydrogen, fluoro and alkyl, or R^5 and R^6 taken together, along with the carbon atom to which they are both attached, form a 3-membered to 7-membered carbocyclic, or heterocyclic ring;

R^7 is independently selected from hydrogen, alkyl, hydroxy, alkoxy, amino, substituted amino, nitro, cyano, halo, carboxy, alkoxycarbonyl, aminocarbonyl, substituted aminocarbonyl and n is 1, 2 or 3; and

Z is selected from hydrogen, alkyl, hydroxy, SH, alkoxy, aryloxy, alkylthio, amino, substituted amino, alkoxycarbonyl, alkanoylamido, aroylamido, heterocyclocarbonylamido, heteroaroylamido, alkanoyl(alkylsubstituted) amido, aroyl(alkylsubstituted)amido, heteroaroyl(alkylsubstituted)amido, and heterocyclocarbonyl(alkyl substituted)amido.

2. The compound of claim 1 having potassium channel inhibitory activity, or a pharmaceutically acceptable salt or prodrug thereof wherein R^2 is



wherein

X is selected from substituted amino, $-N(R^8)COR^9$, $-N(R^8)SO_2R^{10}$, and $-CO-NR^{11}R^{12}$;

R^8 is selected from hydrogen (H), alkyl, aryl and heteroaryl;

R^9 is selected from alkyl, carbocycloalkyl, alkenyl, alkynyl, aryl, alkoxy, aryloxy, heterocyclo, heteroaryl, (aryl)alkyl, (heteroaryl)alkyl, amino and substituted amino;

R^{10} is selected from alkyl, carbocycloalkyl, aryl, heterocyclo and heteroaryl;

R^{11} and R^{12} are independently selected from hydrogen(H), alkyl, carbocycloalkyl, aryl, heterocyclo, heteroaryl, (aryl)alkyl, (heterocyclo)alkyl, (heteroaryl)alkyl, aminoalkyl, and substituted aminoalkyl, or R^{11} and R^{12} taken together with the nitrogen atom to which they are attached form a 4-membered to 8-membered heterocyclic ring;
R^{13} is selected from hydrogen (H), alkyl, aryl, hydroxy, alkoxy, amino, substituted amino, nitro, cyano and halo.

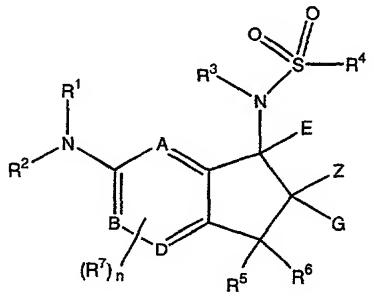
3. The compound of claim 1 having potassium channel inhibitory activity, or a pharmaceutically acceptable salt or prodrug thereof wherein A, B and D are each a substituted carbon atom; E, G and R^7 are each hydrogen and n is 3.

4. The compound of claim 3 having potassium channel inhibitory activity, or a pharmaceutically acceptable salt or prodrug thereof wherein, R^5 and R^6 are each hydrogen.

5. The compound of claim 2 having potassium channel inhibitory activity, or a pharmaceutically acceptable salt or prodrug thereof wherein A, B and D are each a substituted carbon atom; E, G and R^7 are each hydrogen and n is 3.

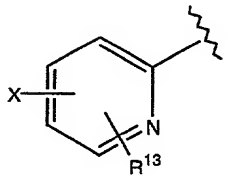
6. The compound of claim 5 having potassium channel inhibitory activity, or a pharmaceutically acceptable salt or prodrug thereof wherein, R^5 and R^6 are each hydrogen.

7. The compound of claim 1 having potassium channel inhibitory activity, said compound having the following formula (III), or a pharmaceutically acceptable salt or prodrug thereof:



(III).

8. The compound of claim 7 having potassium channel inhibitory activity, or a pharmaceutically acceptable salt or prodrug thereof wherein R^2 is



wherein

X is selected from $-N(R^8)COR^9$ and $-CO-NR^{11}R^{12}$;

R^8 is selected from H and alkyl;

R^9 is selected from alkyl, carbocycloalkyl, alkenyl, alkynyl, aryl, alkoxy, aryloxy, heterocyclo, heteroaryl, (aryl)alkyl, (heteroaryl)alkyl, amino and substituted amino;

R^{11} and R^{12} are independently selected from hydrogen(H), alkyl, carbocycloalkyl, aryl, heterocyclo, heteroaryl, (aryl)alkyl, (heterocyclo)alkyl, (heteroaryl)alkyl, aminoalkyl, and substituted aminoalkyl, or R^{11} and R^{12} taken together with the nitrogen atom to which they are attached form a 4-membered to 8-membered heterocyclic ring; and

R^{13} is selected from hydrogen, alkyl, hydroxy, alkoxy, amino, substituted amino, nitro, cyano and halo.

9. The compound of claim 7 having potassium channel inhibitory activity, or a pharmaceutically acceptable salt or prodrug thereof wherein A, B and D are each a substituted carbon atom; E, G and R^7 are each hydrogen and n is 3.

10. The compound of claim 9 having potassium channel inhibitory activity, or a pharmaceutically acceptable salt or prodrug thereof wherein, R^5 and R^6 are each hydrogen.

11. The compound of claim 8 having potassium channel inhibitory activity, or a pharmaceutically acceptable salt or prodrug thereof wherein A, B and D are each a substituted carbon atom; E, G and R^7 are each hydrogen and n is 3.

12. The compound of claim 11 having potassium channel inhibitory activity, or a pharmaceutically acceptable salt or prodrug thereof wherein, R^5 and R^6 are each hydrogen.

13. The compound of claim 1, 3, 4, 7, 9 or 10 having potassium channel inhibitory activity, or a pharmaceutically acceptable salt or prodrug thereof, wherein

R^3 is selected from hydrogen and alkyl;

R^4 is selected from aryl and heteroaryl and

Z is selected from hydrogen, hydroxyl, amino and substituted amino.

14. The compound of claim 2, 5, 6, 8, 11, or 12 having potassium channel inhibitory activity, or a pharmaceutically acceptable salt or prodrug thereof, wherein

R^3 is selected from hydrogen and alkyl;

R^4 is selected from aryl and heteroaryl and

Z is selected from hydrogen, hydroxyl, amino and substituted amino.

15. A pharmaceutical composition comprising the compound of claim 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, or 12, or a pharmaceutically acceptable salt or prodrug thereof and a pharmaceutically acceptable diluent or carrier.

16. A pharmaceutical composition comprising the compound of claim 13, or a pharmaceutically acceptable salt or prodrug thereof and a pharmaceutically acceptable diluent or carrier.

17. A pharmaceutical composition comprising the compound of claim 14, or a pharmaceutically acceptable salt or prodrug thereof and a pharmaceutically acceptable diluent or carrier.

18. A method for inhibiting potassium transport across cellular membranes possessing potassium channels comprising exposing a cell membrane possessing said channels to the presence of a compound of claim 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, or 12, or a pharmaceutically acceptable salt or prodrug thereof.

19. The method of claim 18 wherein the potassium channel is a voltage gated potassium channel.

20. The method of claim 19 wherein the potassium channel is selected from a potassium channel responsible for cardiac I_{Kur} potassium current, a potassium channel responsible for T-lymphocyte I_{Kn} potassium current and potassium channels containing one of Kv1.5 or Kv1.3 α-subunit gene products.

21. A method for treating cardiac arrhythmias which comprises administering to a patient in need thereof, a pharmaceutically effective amount of a compound of claim 1, 2, 3, 4, 5, 6, or 7, or a pharmaceutically acceptable salt or prodrug thereof.

22. A method for treating a cell proliferative disorder which comprises administering to a patient in need thereof, a pharmaceutically effective amount of a compound of claim 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, or 12, or a pharmaceutically acceptable salt or prodrug thereof.